

SHOE INSERT AND METHOD FOR FITTING A SHOEBACKGROUND OF THE INVENTIONField of the Invention

The invention relates to footwear generally, and more specifically, to methods and apparatus used for determining the placement of an individual's foot within a shoe, and whether the respective shoe fits properly on the foot.

Background of the Invention

A well-designed child's shoe should facilitate a healthy pattern of growth and development of the child's foot. It is generally considered desirable for the proper development of a child's foot to allow the foot as much freedom of movement as possible. Providing unrestricted freedom of movement to the foot enables the child to walk with a natural barefoot motion, which in turn facilitates proper growth and development. To enable the child to move with a natural barefoot motion, or a close approximation thereof, a shoe must allow the foot and toes to bend in a natural manner while walking. If a child wears a shoe that is too tight or otherwise restricts his or her foot's movement, the child's foot, toes or ankle may sustain injury and/or may fail to grow and develop in a healthy manner. In some cases, growth and developmental problems may be caused by even a mildly constricting shoe, well before the child begins to express discomfort. In addition, very young children typically begin to walk before they can talk; consequently, even after a shoe begins to constrict and cause pain to a child's foot, he or she may not have the ability to communicate the nature of the problem. Accordingly, it is imperative for a parent to have the ability to determine if a particular shoe fits a child's foot, and

equally importantly, to determine easily and in a timely manner when the child has outgrown the shoe.

Unfortunately, it is very common today for children to continue to wear shoes which they have outgrown. One source of this problem is the rapid rate at which children's feet grow. In some cases, a child's foot may outgrow a new, properly fitting shoe in less than two months.

A related problem is the lack of opportunity parents have today to measure their children's feet and determine whether or not a given child has outgrown his or her shoes. For example, many households currently have no apparatus designed specifically to measure the size of a child's foot. Similarly, most households have no apparatus for determining whether or not a child's foot has outgrown a particular shoe. As a result, many children receive new shoes in a haphazard manner. For example, in many families a child may have his or her feet measured during occasional visits to a shoe store, where new shoes are fitted and purchased; however, in between these visits, little or no attention may be given to the growth of the feet within the shoes, unless and until the child expresses severe discomfort. This lack of regular monitoring increases the risk that the child may suffer injury or growth-related problems in the feet, toes and/or ankles.

There is, therefore, a need for a device and/or a method for easily and accurately measuring the placement of a child's foot within a shoe, and for determining whether a child has outgrown the shoe.

### SUMMARY OF THE INVENTION

To overcome the problems described above, an apparatus and method are provided for determining the placement of an individual's foot within a shoe, and for determining whether the

individual's foot has outgrown the shoe. Accordingly, in one embodiment, a shoe insert is provided that has one or more visible symbols printed on the top surface thereof. The symbols may include, for example, lines showing the desired placement of a foot and toes on the insert. In one embodiment, the area on the insert situated between the line representing the ends of the toes and the front edge of the insert is referred to as the "ouch zone."

In one embodiment, the insert includes a top layer composed substantially of a material capable of absorbing perspiration produced by a foot. For example, the top layer may be composed of unfinished leather.

In one embodiment, the shoe may be a child's shoe. In this embodiment, the shoe is placed on a child's foot, and is worn by the child, during which time perspiration is produced by the child's foot and is absorbed by the insert. The perspiration causes one or more markings to appear on the top surface of the insert. The insert is then removed from the shoe and examined. In particular, the one or more markings caused by the perspiration are examined to determine the placement of the child's foot within the shoe. The position of the markings in relation to the one or more symbols on the insert is also examined. For example, in one embodiment, markings made by the child's toes may be examined to determine whether or not the toes extend into the ouch zone. In this embodiment, if the markings made by the child's toes extend into the ouch zone, the child has outgrown the shoe and the shoe should no longer be worn by the child.

In another embodiment, an insert is provided having disposed on a selected portion of the surface thereof a substance capable of absorbing, and reacting with, perspiration, to produce a visible record of the actual placement of a wearer's foot. The substance may be disposed, for example, in a region along the front edge of the insert. In this embodiment, the wearer, e.g., a child, wears a shoe containing the insert, and perspiration produced by the child's foot is

deposited on the surface of the insert. When the substance disposed on the surface absorbs and reacts with the perspiration, a visible indication is produced that the child has outgrown the shoe. The visible indication may be, e.g., a word, or an image such as a circle.

In yet another embodiment, a shoe is provided, comprising an upper and an insert having attributes described above.

#### BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the invention will be apparent to those skilled in the art from the following detailed description of selected embodiments, taken together with the accompanying drawings, in which:

FIG. 1 illustrates a shoe insert, in accordance with an embodiment of the invention;

FIG. 2 illustrates a shoe containing the insert of Fig. 1, in accordance with an embodiment of the invention;

FIG. 3 shows a cross-section of the insert of Fig. 1, in accordance with an embodiment of the invention;

FIG. 4 is a flowchart depicting a method for utilizing the insert of Fig. 1 to determine whether or not a child has outgrown a shoe, in accordance with an embodiment of the invention; and

FIG. 5 illustrates a shoe insert, in accordance with another embodiment of the invention.

### DETAILED DESCRIPTION OF THE INVENTION

In a first aspect of the invention, a shoe insert is provided for use in a child's shoe. In one embodiment, the insert has arranged on its upper surface one or more symbols representing a desired placement of the wearer's (e.g., the child's) foot in a particular shoe. For example, Fig. 1 shows a shoe insert 100, according to one embodiment. In this embodiment, the insert 100 has, printed on one side, lines 65 representing an outline of a child's foot on the insert 100. Lines 65 represent selected parts of a child's foot and indicate the desired placement of the foot within the shoe. In this embodiment, the lines 65 may include, for example, line 71 approximating the placement of the heel, arch and ball of a child's foot, ovals 73 approximating the placement of a child's toes, and line 79 representing the ends of the toes. The region 84 on the insert that lies between the line 79 and the front edge 86 of the insert 100 is referred to as the "ouch zone."

It should be noted that the insert 100 does not necessarily correspond to a standard shoe size; instead, in a second aspect of the invention, the insert 100 is manufactured for a particular shoe, is shaped uniquely to fit into the shoe, and functions as an integral part of the shoe. Referring to Fig. 2, shoe 350 comprises an upper 310, the insert 100, and an outsole 340. In this embodiment, the insert 100 serves as the insole for the shoe 350. Accordingly, the insert 100 is die-cut to fit the shoe 350. Referring to a well-known manufacturing process, the insert 100 conforms to the inside of the shoe 350 and the last bottom papers specifically designed for this purpose. Thus, the shoe 350 and the insert 100 are worn at all times together, and the insert 100 functions properly only with the shoe 350, for which it is designed and manufactured. It should be noted that the one-to-one relationship between the shoe 350 and the associated insert 100 has distinct benefits. For example, because the insert 100 is an integral part of the shoe 350 and

remains in the shoe 100 on a regular basis, the possibility that the insert 100 may be lost, misplaced or damaged is minimized.

Fig. 3 shows a cross-section of the insert 100, in accordance with one embodiment. The insert 100 comprises three layers 220, 230 and 240. In this embodiment, the bottom layer 220 is porous, having holes that serve to force air upwards to cool the foot. In one embodiment, the bottom layer 220 may be composed of, for example, polyurethane. In this embodiment, the middle layer 230 may be composed of, for example, an antibacterial material, or polyurethane. Alternatively, the middle layer may be composed of latex. The top layer 240 is composed of a material that is capable of absorbing perspiration from the child's foot and, in response, producing a visible record of the actual placement of the child's foot and toes within the shoe. In one embodiment, the top layer 240 may be composed of, for example, unfinished leather. In an alternative embodiment, the top layer 240 may be composed of a synthetic, poromeric material.

For much of a child's early years, the child's foot is in a nearly continuous state of growth and development. This growth is associated with a high level of muscular and other activity by and within the child's foot. As a result of this activity, a typical child's foot produces a substantial amount of perspiration. In many cases, a child's foot will produce a significant amount of perspiration within a few hours.

The inventor realized that the tendency for a child's foot to produce substantial quantities of perspiration may be used beneficially to determine whether or not the child has outgrown a particular shoe. Accordingly, in a third aspect of the invention, the top surface of the insert 100 absorbs perspiration from a child's foot and, in response, produces a visible record, or marking, of the actual placement of the child's foot in the shoe. In one embodiment, a child may wear a shoe, e.g., shoe 350, containing the insert 100, for a period of time, and during this time his or

her foot produces a quantity of perspiration which is absorbed by the top layer 240 of the insert 100. In this embodiment, the perspiration absorbed by the insert 100 causes one or more markings to appear on the top layer 240 of the insert 100. For example, in an embodiment in which the top layer 240 is composed of unfinished leather, certain regions of the unfinished leather may absorb a substantial amount of perspiration and, in response, appear visibly darker than other areas that absorb little or no perspiration. In this embodiment, the darkened areas tend to appear more prominently in regions where the child's toes or the bottom of the child's foot are in frequent contact with the surface of the insert 100. In this embodiment, the insert 100 may be removed from the shoe 350, and the darkened areas may be examined to determine the actual placement of the child's foot within the shoe 350.

In another embodiment, the markings on the insert 100 that are caused by the perspiration from the child's foot are further examined to determine whether or not the child has outgrown the shoe. Fig. 4 is a flowchart depicting a method for utilizing the insert 100 to determine whether or not a child has outgrown a particular shoe, in accordance with one embodiment. At step 420, a shoe, e.g., the shoe 350, containing the insert 100, is placed on the child's foot. At step 430, the child is allowed to wear the shoe 350 for a sufficient period of time to allow a quantity of perspiration to be generated by the child's foot and absorbed by the top layer 240 of the insert 100. Accordingly, the top layer 240 absorbs the perspiration from the child's foot and, in response, markings appear on the top layer 240 of the insert 100. This process may occur relatively quickly. For example, in an embodiment in which the top layer 240 is composed substantially of unfinished leather, after the child begins to wear the shoe 350 containing the insert 100, markings may begin to appear on the surface of the insert 100 after approximately two hours.

At step 440, the shoe 350 is removed from the child's foot, and at step 450, the insert 100 is removed from the shoe 350. At step 460, the markings produced by the perspiration are examined to determine whether or not the shoe 350 fits the child's foot. In particular, referring to the embodiment of Fig. 1, the markings produced in the region of the child's toes may be examined to determine whether or not the child's toes have grown into the ouch zone 84. If the child's toes extend into this region, the child's toes (and possibly other parts of the child's foot) are most likely constricted by the shoe 350. Accordingly, referring to block 470, if the markings produced in the toe region of the insert 100 extend beyond the line 79 into the ouch zone 84, the child has outgrown the shoe 350, and thus the shoe 350 is too small for the child's foot and should not be worn (step 474). If the markings produced in the toe region do not extend beyond the line 79 into the ouch zone 84, the child has not yet outgrown the shoe 350 (step 476). In this case, the insert may be reinserted into the shoe.

It should be noted that the markings caused by perspiration remain on the insert 100 and expand on the surface of the insert 100 as the child's foot grows. The next time a measurement of the foot is desired, the insert 100 may be removed from the shoe and examined immediately. Thus, the insert 100 constitutes a readily available measure of whether or not the child has outgrown the shoe 350.

In yet another embodiment, an insert is provided having disposed on its upper surface a chemical or other substance capable of absorbing, and reacting with, the perspiration produced by a child's foot. In one embodiment, the substance reacts with the perspiration to produce on the surface of the insert a record of the placement of the child's foot in the shoe, e.g., an indication when the child has outgrown the shoe. For example, in one embodiment, a region may be defined at the front edge of the insert which is deemed unsafe for the child's toes (i.e., it



is likely that any toes extending into this region will be constricted by the shoe). This region may be referred to as the "danger zone." A substance that is transparent initially, but produces a visible indication upon absorbing the person's perspiration, is disposed on the portion of the insert that lies within the danger zone. In this embodiment, the insert may have an upper surface which initially has a generally uniform appearance (i.e., with no visible indications, lines, etc.). As long as the child's toes do not extend into the danger zone, little or no perspiration is absorbed by the substance and the surface of the insert retains its uniform appearance. When the child's toes grow into the danger zone, the toes deposit perspiration onto the substance. The substance reacts with the perspiration and produces a visible indicator that the child has outgrown the shoe.

In one embodiment, a substance that changes color in response to perspiration is utilized. For example, a substance that is initially transparent, but changes color in response to perspiration, may be disposed across all or substantially all of the danger zone. Accordingly, when the child's toes begin to grow into the danger zone, the portion of the insert that lies in the danger zone begins to change color. In an alternative embodiment, the substance may be disposed on the surface in the form of an image, e.g., a word, a circle, a series of dots, etc.

By way of example, the insert 115 shown in Fig. 5 has disposed on its surface a substance that forms the word "ouch." In this embodiment, the substance initially is transparent or has the same color and appearance as the remainder of the upper surface of the insert 115. The insert is placed into a child's shoe and worn by the child. The child's foot produces perspiration as discussed above during the time he or she wears the shoe; however, as long as the child's foot fits as intended in the shoe, the child's toes do not extend into the danger zone and little or no perspiration is deposited on the substance. As a result, as long as the child's foot fits as intended

in the shoe, the substance remains unseen and the word "ouch" is not visible. As the child's foot grows, his or her toes gradually extend into the danger zone and begin to deposit perspiration on the substance. The substance absorbs the perspiration and changes color in response. As a result, the word "ouch" becomes visible on the surface of the insert. In one embodiment, the word "ouch" may appear little by little, as the child's toes gradually extend farther and farther into the danger zone.

The inserts and methods described herein allows a parent, e.g., a mother, to ensure that her child at all times wears properly fitting shoes. For example, she may utilize one or more of these inserts and/or methods to readily detect if her child has outgrown a shoe, and if so, replace the shoe with a larger, properly fitting shoe. The inserts and methods described herein have an additional benefit in that the mother may perform such measurements regularly, easily, and at her own convenience. In particular, she may do so at home, without the need to visit a shoe store. In this way, the mother may facilitate the proper growth and development of the child's foot.

The foregoing merely illustrates the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise numerous other arrangements which embody the principles of the invention and are thus within its spirit and scope. For example, the inserts and methods described herein may also have advantages and uses for teenagers and adults.